



caBIG™

cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Body Mass Index

**Mary Cooper, SAIC
Context Administrators
1/11/07**

Issues for Consideration

- ▶ **Focus:**

- Value components to calculate BMI of an adult person

- Capture of pre-calculated BMI components

- ▶ **Specificity:**

- Different formulas for international customary and metric units

- ▶ **Applicable Standards/References:**

- NHLBI, CDC, CDIS, CDUS, NAACCR, SEER

- ▶ **Out of Scope:**

- Interpretation of BMI

- BMI for Age (Interpretation of BMI for children and teens)



Use Case Analysis

- ▶ Purpose of the Standard:
 - Capture of Body Mass Index for Adults

- ▶ Use/Applications:
 - Screen for weight categories that may lead to health problems
 - Categorize populations for statistical analysis



High Level Usage/Relevant Standards

- ▶ Standards, usage examples, and/or reporting requirements, from external sources.
 - HL7 v2
 - HL7 v3 RIM
 - BRIDG
 - CDC
 - NHLBI (National Heart, Lung and Blood Institute)
 - NCMHD (National Center on Minority Health and Health Disparities)

Current caDSR CDEs

Long Name	Preferred Question Text	Owned By	Used By Context	Registration Status	Workflow Status	Public ID	Version
Body Mass Index Measurement Two Year Value	2 Years	CCR		Qualified	RELEASED	2202161	1.0
Body Mass Index Ten Year Past Value	10 Years	CCR		Qualified	RELEASED	2202163	1.0
Patient Body Mass Index Measurement	Body Mass Index (BMI)	SPOREs	CCR,DCP,NHLBI	Qualified	RELEASED	2006410	1.0
Derived Body Mass Index	kg/m2	PS&CC			DRAFT NEW	2197822	1.0

Data Element Concept Details

Public ID:	2014287
Version:	1.0
Long Name:	Person Body Mass Index
Short Name:	PRSN_BMI
Definition:	A person's body weight in kilograms divided by the square of his/her height in meters (i.e., wt/(ht) ²).
Context:	SPOREs
Workflow Status:	RELEASED
Conceptual Domain Public ID:	2008552
Conceptual Domain Short Name:	PHYS_DESC_OF_INDS
Conceptual Domain Context Name:	CTEP
Conceptual Domain Version:	1.0
Origin:	

Object Class

Public ID:	2236731
Version:	1.0
Long Name:	Person
Short Name:	C25190
Context:	caBIG
Qualifier:	

Object Class Concepts

Concept Name	Concept Code	Public ID	Definition Source
Person	C25190	2202486	NCI

Property

Public ID:	2177669
Version:	1.0
Long Name:	Body Mass Index
Short Name:	BMI
Context:	SPOREs
Qualifier:	

Property Concepts

Concept Name	Concept Code	Public ID	Definition
Body Mass Index	C0005893	2203373	MSH2001

Current caDSR CDEs

Value Domain Details

Public ID:	2018654
Version:	1.0
Long Name:	Body Mass Index Measurement
Short Name:	BMI_MSRMT
Definition:	A person's body weight in kilograms divided by the square of his/her height in meters (i.e., wt/(ht) ²).
Workflow Status:	RELEASED
Datatype:	NUMBER
Unit of Measure:	
Display Format:	
Maximum Length:	4
Minimum Length:	
Decimal Place:	1
High Value:	
Low Value:	
Value Domain Type:	Non Enumerated
Conceptual Domain Public ID:	2008509
Conceptual Domain Short Name:	SPORES
Conceptual Domain Context Name:	SPOREs
Conceptual Domain Version:	2.31
Origin:	

Data Element Derivation Details

Derivation Type	CALCULATED
Rule:	Weight (kg) divided by height squared in meters.
Method:	Using the value for 'weight' in kg, divide that number by the value for 'height' in meters squared. The result is the Body Mass Index.
Concatenation Character:	

Component Data Elements

Display Order	Long Name	Context	Workflow Status	Public ID	Version
1	Body Weight in Kilograms	CCR	RELEASED	2003303	3.0



Proposed Components for Standardization

- ▶ Body Mass Index
- ▶ Weight
- ▶ Height
- ▶ Unit of Measure
- ▶ Source of Information

Recommendations

Person Body Mass Index Value

Person Body Mass Index

Public ID 2014287v2.0

(Reused from SPOREs with modifications to property and definition)

Body Mass Index Value

Public ID 2018654v2.0

(Reused from SPOREs with modification of Representation and Conceptual Domain)

Person Body Mass Index Value

Public ID 2006410v2.0

(Reused from SPOREs with Modification to Long Name and Definition)



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Recommendation Details

Person Body Mass Index Value

Person Body Mass Index

Object = Person (C25190)

Property = Body Mass Index (C16358)

Definition: The body fat an individual is carrying based upon the ratio of weight to height.

Body Mass Index Value

Representation Term: Value (C25712)

Definition: A calculated numerical quantity that represents the body fat an individual is carrying based upon the ratio of weight to height.

Data Type = Number

Max length = 4

Decimal place = 1

Unit of measure = kg/m²

Person Body Mass Index Value

Definition: A calculated numerical quantity that represents the body fat an individual is carrying based upon the ratio of weight to height.



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Recommendation Details

Person Body Mass Index Value

Data Element Derivation Details

Person Body Mass Index Value

Derivation Type: Calculated

Rule: $\text{weight}/[\text{height}]^2$ for metric units,
or $\text{weight}/[\text{height}]^2 \times 703$ for conventional units

Method: Using the measurement for height in meters, determine the square of the value. Divide the value for weight in kilograms by the square of the height in meters. If height is measured in centimeters, divide value by 100 to obtain meter value. If height and weight are measured in conventional units the formula is multiplied by a conversion factor of 703.

Component Data Elements:

1. Person Weight Value
2. Person Height Value



Recommendations

Person Weight Value

Person Weight

Public ID 2012673v2.0

Object = Person (C25190)

Property = Weight (C25208)

Definition: The vertical force exerted by the mass of an individual as a result of gravity.

(Reused from CCR with modifications to Long Name and definition)

Weight Value

Public ID 2179445v2.0

Representation = Value (C25712)

Definition: The numerical result of the determination of the vertical force exerted by the mass of an individual as a result of gravity.

Data Type = Number

Max Length = 5

Decimal place = 2

(Reused from DCP with modification to Rep. Term, definition and conceptual domain)

Person Weight Value

Public ID 2179689v2.0

Definition: The number that describes the vertical force exerted by the mass of an individual as a result of gravity.

(Reused from DCP with Modification to Long Name and Definition)



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Recommendations

Person Height Value

Person Height

Public ID 2012401v2.0

Object = Person (C25190)

Property = Height (C25347)

Definition: The vertical distance from the base to the top of an individual.

(Reused from CCR with modifications to Long Name and definition)

Height Value

Public ID 2179483v2.0

Representation = Value (C25712)

Definition: The numerical result of the determination of the vertical distance of an individual.

Data Type = Number

Max Length = 5

Decimal place = 2

(Reused from DCP with modification to Rep. Term, definition and conceptual domain)

Person Height Value

Public ID 2179643v2.0

Definition: The number that describes the vertical distance of an individual.

(Reused from DCP with Modification to Long Name and Definition)



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Recommendations

Personal Attribute Unit of Measure UCUM Code

Personal Attribute Unit of Measure New CDE

Object = Personal Attribute (C19332)
Property = Unit of Measure (C25709)

Definition: A named quantity in terms of which other quantities are measured or specified for the distinguishing qualities or prominent aspects of an individual person.

Personal Attribute UCUM Code Public ID 2179483v1.0

Representation = Code (C)
Qualifier = Unified Code for Units of Measure (C)

Definition: The Unified Code for Units of Measure symbols that represent a determinate amount or quantity used as the standard of measurement for the size, magnitude or capacity of the distinguishing qualities or prominent aspects of an individual person.

Data Type = Character
Max Length = 25
Permissible Values: g, kg, m, cm, etc.

Personal Attribute Unit of Measure UCUM Code Public ID 2179643v1.0

Definition: The Unified Code for Units of Measure symbols that represent a determinate amount or quantity used as the standard of measurement for the size, magnitude or capacity of the distinguishing qualities or prominent aspects of an individual person.



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Recommendations

Information Report Source Type

Information Report Source

Public ID 2197801v2.0 (reused from DCP)

Object = Information (C48191)
Property = Source (C25683)
Prop. Qualifier = Report (C25375)

Definition: Knowledge that has been gathered or received by communication from direct measurement or from an individual's account.

Information Report Source Type

Public ID 2197795v2.0 (reused from PS&CC)

Representation = Type (C25284)

Definition: A subdivision of a particular kind of knowledge that has been gathered or received by communication from direct measurement or from an individual's account.

Data Type = Character
Max Length = 20

Permissible Values

Estimated Value
Measured Value
Reported by Proxy
Self Report

Information Report Source Type

Public ID 2197801v2.0

Definition: The number that describes the vertical distance of an individual.

(Reused from PS&CC with Modification to Long Name and Definition)



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Recommendation Details

Template [Object Class] Body Mass Index Value

[Object Class] Body Mass Index

Object: Object Class

Property: Body Mass Index

Definition: The body fat an individual is carrying based upon the ratio of weight to height.

Body Mass Index Value

Public ID 2018654v1.0

Representation Term: Value (C25712)

Definition: A calculated numerical quantity that represents the body fat an individual is carrying based upon the ratio of weight to height.

Data Type = Number

Max length = 4

Decimal place = 1

Unit of measure = kg/m²

Template [Object Class] Body Mass Index Value

Definition: A calculated numerical quantity that represents the body fat an individual is carrying based upon the ratio of weight to height. [Explanatory comment: When there is a need to capture body mass index, this template can be used to create descriptive data elements by using any Object Class to replace the [Object Class] term in brackets.]



caBIG™ cancer Biomedical
Informatics Grid™

an initiative of the National Cancer Institute

Discussion

- ▶ Questions
- ▶ Next Steps:
- ▶ Propose to VCDE Small Group

